

## **Solar System Exploration, Astrobiology, and Sample Return Missions: A Challenge for Science Communication**

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Recent results from studies of extreme environments on Earth have demonstrated life's tenacity in ways thought impossible only decades ago. Coupled with emerging evidence of surface water and recent volcanism on Mars, and of a possible ocean beneath the surface of Jupiter's moon Europa, these studies have made the solar system an intriguing place to look for the existence of life beyond the Earth. It now seems likely that places like Mars or Europa contain sites where current Earth organisms could survive. And of course, we cannot rule out indigenous spectre of biological contamination. Without hard evidence on the existence or nature of life elsewhere, communicating the scientific issues associated with the exobiological exploration of the solar system is a particular challenge. The uncertainties associated with studies of the extraterrestrial environments – and their potential to support life – exacerbate the problem. Similarly, these uncertainties complicate questions pertaining to go to our responsibility to explore these environments without biological contamination, while, protecting the Earth from the potential harm from contamination that could accompany a returned sample. The resolution of scientific and technical uncertainties associated with these issues await further data, but that data may only be obtainable if the issues are effectively communicated to the public, the mission designers, and the scientific community itself.